

# COMPOSITIONS CONTAINING MALONATE SALTS IN PREVENTING IN-GROWN HAIR ARISING FROM SHAVING

## BACKGROUND OF THE INVENTION

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### Field of the Invention

[0001] The invention concerns shaving and pre-shaving preparations effective on skin having in-grown hairs.

### The Related Art

10 [0002] Men in many societies are expected to be clean shaven. The process is usually accomplished in the morning, often sleepy-eyed in a ritual removing the unsightly stubble on face and throat. The desired result of a smooth skin surface encounters many obstacles.

15 [0003] The basic process of drawing a blade across a body surface is best done on a perfectly flat template. Of course, every face possesses unique deviations from the perfectly flat. A shave may be close or too close in certain areas and insufficiently close in others. Parameters of elasticity, turgo, smoothness and hair type are further considerations. The art has moved to compensate for these deviations. One approach is  
20 optimization of a razor system. The other involves applying pre-shaving

compositions to prepare the skin or use of lubricating compositions during the cutting process.

[0004] Shaving for black males can be particularly difficult. This group of individuals often possesses facial hair with natural curvature. When hair is sharpened through razor contact it can either penetrate the epidermis in an arc or pierce the follicular wall. Penetration elicits a painful response.

[0005] The art has responded to the problem of in-grown hair. U.S. Patent 4,775,530 (Perricone) treats "razor bumps" with alpha-hydroxyacids or derivatives thereof. U.S. Patent 6,156,299 (Rosen et al.) topically applies a acetylsalicylic acid composition to beard areas of the face as an after shave to inhibit in growth. U.S. Patent 5,962,018 (Curtis et al.) discloses a method for treating in-grown with an anhydrous composition containing a water soluble organic acid encapsulated into hydrophobic microspheres. The organic acid can elute in the presence of water and applied to the skin. Another approach is found in U.S. Patent 6,461,599 (Reuben) disclosing formulating a shaving composition with abrasive particles for aiding in liberation of hairs grown aberrantly. Still another approach is found in U.S. Patent 4,944,939 (Moore) describing a shaving composition incorporating salicylic acid, a glucocorticoid and sulphur.

[0006] None of the foregoing approaches to controlling the in-grown hair problem have fully met expectations of those experiencing the problem.

## SUMMARY OF THE INVENTION

[0007] A method for preventing in-grown hair resulting from a shaving process,  
5 the method comprising:

providing a cosmetic composition including:

- (i) from about 0.1 to about 30% by weight of a neutralized salt of non-hydroxy substituted C<sub>2</sub>-C<sub>40</sub> dicarboxylic acid;
- (ii) from about 1 to about 99.9% by weight of a cosmetically  
10 acceptable carrier;

applying the composition to an area of skin designated for shaving, the application being prior to, concurrent with or subsequent to removing hair by razor action.

## DETAILED DESCRIPTION OF THE INVENTION

15 [0008] Non-hydroxy dicarboxylic acids according to the invention include malonic acid, succinic acid, fumaric acid, maleic acid, glutaric acid, adipic acid, phthalic acid, terephthalic acid and combinations thereof. Most preferred is malonic acid.

- 5 [0009] The dicarboxylic acids are neutralized with ammonia, amino acid, urea, alkali metal or alkaline earth metal bases to form dicarboxylic acid salts. Illustrative cations include ammonium, sodium, lithium, potassium, magnesium, and mixtures thereof. Particularly preferred is ammonium malonate.
- 10 [00010] When amino acids or their derivatives are utilized as the neutralizers, they may be selected from glycine, trimethylglycine, arginine, lysine, glutamine and mixtures thereof. The salts may either be a mono- or di-salt. When both mono- and di-salts are present, they may range in a molar ratio from about 1000:1 to about 1:1000, preferably from about 10:1 to about 1:500, more preferably from about 2:1 to about 1:200, optimally from about 1:1 to about 1:20.
- 15 [00011] Amounts of the salt according to the present invention may range from about 0.1 to about 30%, preferably from about 0.5 to about 20%, more preferably from about 1 to about 15%, optimally from about 3 to about 10% by weight of the composition.
- 20 [00012] Compositions of this invention will also include a cosmetically acceptable carrier. Amounts of the carrier may range from 1 to 99.9%, preferably from about 70 to about 95%, optimally from about 80 to about 90%. Among the useful carriers are water, emollients, fatty acids, fatty alcohols, C<sub>1</sub>-C<sub>3</sub> lower alcohols, humectants, thickeners and combinations thereof. The carrier may be aqueous, anhydrous or an emulsion. Preferably the compositions are aqueous, especially water and oil emulsions of the W/O or O/W or W/O/W triplex variety. Water

when present may be in amounts ranging from about 5 to about 95%, preferably from about 20 to about 70%, optimally from about 35 to about 60% by weight.

5 [00013] Emollient materials may serve as cosmetically acceptable carriers. These may be in the form of silicone oils, synthetic esters and hydrocarbons. Amounts of the emollients may range anywhere from about 0.1 to about 95%, preferably between about 1 and about 50% by weight.

10 [00014] Silicone oils may be divided into the volatile and nonvolatile variety. The term "volatile" as used herein refers to those materials which have a measurable vapor pressure at ambient temperature. Volatile silicone oils are preferably chosen from cyclic (cyclomethicone) or linear polydimethylsiloxanes containing from 3 to 9, preferably from 4 to 5, silicon atoms.

15 [00015] Nonvolatile silicone oils useful as an emollient material include polyalkyl siloxanes, polyalkylaryl siloxanes and polyether siloxane copolymers. The essentially nonvolatile polyalkyl siloxanes useful herein include, for example, polydimethyl siloxanes with viscosities of from about  $5 \times 10^{-6}$  to  $0.1 \text{ m}^2/\text{s}$  at 25 C. Among the preferred nonvolatile emollients useful in the present compositions are the polydimethyl siloxanes having  
20 viscosities from about  $1 \times 10^{-5}$  to about  $4 \times 10^{-4} \text{ m}^2/\text{s}$  at 25 C.

[00016] Another class of nonvolatile silicones are emulsifying and non-emulsifying silicone elastomers. Representative of this category is Dimethicone/Vinyl Dimethicone Crosspolymer available as Dow

Corning 9040, General Electric SFE 839, and Shin-Etsu KSG-18. Silicone waxes such as Silwax WS-L (Dimethicone Copolyol Laurate) may also be useful.

[00017] Among the ester emollients are:

- 5 (1) Alkenyl or alkyl esters of fatty acids having 10 to 20 carbon atoms. Examples thereof include isoarachidyl neopentanoate, isononyl isonanonoate, oleyl myristate, oleyl stearate, and oleyl oleate.
- (2) Ether-esters such as fatty acid esters of ethoxylated fatty alcohols.
- 10 (3) Polyhydric alcohol esters. Ethylene glycol mono and di-fatty acid esters, diethylene glycol mono- and di-fatty acid esters, polyethylene glycol (200-6000) mono- and di-fatty acid esters, propylene glycol mono- and di-fatty acid esters, polypropylene glycol 2000 monooleate, polypropylene glycol 2000 monostearate, ethoxylated propylene glycol monostearate, glyceryl mono- and di-
- 15 fatty acid esters, polyglycerol poly-fatty esters, ethoxylated glyceryl mono-stearate, 1,3-butylene glycol monostearate, 1,3-butylene glycol distearate, polyoxyethylene polyol fatty acid ester, sorbitan fatty acid esters, and polyoxyethylene sorbitan fatty acid esters are satisfactory polyhydric alcohol esters. Particularly useful are
- 20 pentaerythritol, trimethylolpropane and neopentyl glycol esters of C<sub>1</sub>-C<sub>30</sub> alcohols.
- (4) Wax esters such as beeswax, spermaceti wax and tribehenin wax.

- (5) Sterols esters, of which cholesterol fatty acid esters are examples thereof.
- (6) Sugar ester of fatty acids such as sucrose polybehenate and sucrose polycottonseedate.

- 5 [00018] Hydrocarbons which are suitable cosmetically acceptable carriers include petrolatum, mineral oil, C<sub>11</sub>-C<sub>13</sub> isoparaffins, polyalphaolefins, and especially isohexadecane, available commercially as Permethyl 101A from Presperse Inc.
- 10 [00019] Fatty acids having from 10 to 30 carbon atoms may also be suitable as cosmetically acceptable carriers. Illustrative of this category are pelargonic, lauric, myristic, palmitic, stearic, isostearic, hydroxystearic, oleic, linoleic, ricinoleic, arachidic, behenic and erucic acids.
- 15 [00020] Fatty alcohols having from 10 to 30 carbon atoms are another useful category of cosmetically acceptable carrier. Illustrative of this category are stearyl alcohol, lauryl alcohol, myristyl alcohol and cetyl alcohol.
- 20 [00021] Humectants of the polyhydric alcohol-type can be employed as cosmetically acceptable carriers. Typical polyhydric alcohols include glycerol, polyalkylene glycols and more preferably alkylene polyols and their derivatives, including propylene glycol, dipropylene glycol, polypropylene glycol, polyethylene glycol and derivatives thereof, sorbitol, hydroxypropyl sorbitol, hexylene glycol, 1,3-butylene glycol, isoprene glycol, 1,2,6-hexanetriol, ethoxylated glycerol, propoxylated

glycerol and mixtures thereof. The amount of humectant may range anywhere from 0.5 to 50%, preferably between 1 and 15% by weight of the composition.

- 5 [00022] Thickeners can be utilized as part of the cosmetically acceptable carrier of compositions according to the present invention. Typical thickeners include crosslinked acrylates (e.g. Carbopol 982®), hydrophobically-modified acrylates (e.g. Carbopol 1382®), polyacrylamides (e.g. Sepigel® 305), polytaurates (e.g. Aristoflex AVC and HMB), cellulosic derivatives and natural gums. Among useful cellulosic derivatives are sodium
- 10 carboxymethylcellulose, hydroxypropyl methocellulose, hydroxypropyl cellulose, hydroxyethyl cellulose, ethyl cellulose and hydroxymethyl cellulose. Natural gums suitable for the present invention include guar, xanthan, sclerotium, carrageenan, pectin and combinations of these gums. Inorganics may also be utilized as thickeners, particularly clays
- 15 such as bentonites and hectorites, fumed silicas, and silicates such as magnesium aluminum silicate (Veegum®). Amounts of the thickener may range from 0.0001 to 10%, usually from 0.001 to 1%, optimally from 0.01 to 0.5% by weight.
- 20 [00023] Cosmetic compositions of the present invention may be in any form. These forms may include lotions, creams, gels, serums, roll-on formulations, sticks, mousses, aerosol and non-aerosol sprays and pad-applied formulations.



- 5 [00024] Surfactants may also be present in cosmetic compositions of the present invention. Total concentration of the surfactant when present may range from about 0.1 to about 40%, preferably from about 1 to about 20%, optimally from about 1 to about 5% by weight of the composition. The surfactant may be selected from the group consisting of anionic, nonionic, cationic and amphoteric actives. Particularly preferred nonionic surfactants are those with a C<sub>10</sub>-C<sub>20</sub> fatty alcohol or acid hydrophobe condensed with from 2 to 100 moles of ethylene oxide or propylene oxide per mole of hydrophobe; C<sub>2</sub>-C<sub>10</sub> alkyl phenols
- 10 condensed with from 2 to 20 moles of alkylene oxide; mono- and di-fatty acid esters of ethylene glycol; fatty acid monoglyceride; sorbitan, mono- and di- C<sub>8</sub>-C<sub>20</sub> fatty acids; and polyoxyethylene sorbitan as well as combinations thereof. Alkyl polyglycosides and saccharide fatty amides (e.g. methyl gluconamides) are also suitable nonionic surfactants.
- 15 [00025] Preferred anionic surfactants include soap, alkyl ether sulfates and sulfonates, alkyl sulfates and sulfonates, alkylbenzene sulfonates, alkyl and dialkyl sulfosuccinates, C<sub>8</sub>-C<sub>20</sub> acyl isethionate, C<sub>8</sub>-C<sub>20</sub> alkyl ether phosphates, C<sub>8</sub>-C<sub>20</sub> sarcosinates and combinations thereof.
- 20 [00026] Sunscreen actives may also be included in compositions of the present invention. Particularly preferred are such materials as ethylhexyl p-methoxycinnamate, available as Parsol MCX®, Avobenzene, available as Parsol 1789® and benzophenone-3, also known as Oxybenzone. Inorganic sunscreen actives may be employed such as microfine titanium dioxide, zinc oxide, polyethylene and various other polymers. Amounts

of the sunscreen agents when present may generally range from 0.1 to 30%, preferably from 2 to 20%, optimally from 4 to 10% by weight.

5 [00027] Preservatives can desirably be incorporated into the cosmetic compositions of this invention to protect against the growth of potentially harmful microorganisms. Suitable traditional preservatives for compositions of this invention are alkyl esters of para-hydroxybenzoic acid. Other preservatives which have more recently come into use include hydantoin derivatives, propionate salts, and a variety of quaternary ammonium compounds. Cosmetic chemists are familiar with appropriate preservatives and routinely choose them to satisfy the preservative challenge test and to provide product stability. Particularly preferred preservatives are phenoxyethanol, methyl paraben, propyl paraben, imidazolidinyl urea, sodium dehydroacetate and benzyl alcohol. The preservatives should be selected having regard for the use of the composition and possible incompatibilities between the preservatives and other ingredients in the emulsion. Preservatives are preferably employed in amounts ranging from 0.01% to 2% by weight of the composition.

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20 [00028] Compositions of the present invention may include vitamins. Illustrative vitamins are Vitamin A (retinol), Vitamin B<sub>2</sub>, Vitamin B<sub>6</sub>, Vitamin C, Vitamin E and Biotin. Derivatives of the vitamins may also be employed. For instance, Vitamin C derivatives include ascorbyl tetraisopalmitate, magnesium ascorbyl phosphate and ascorbyl glycoside. Vitamin A derivatives may include retinyl palmitate or acetate. Derivatives of Vitamin E include tocopheryl acetate, tocopheryl palmitate and

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tocopheryl linoleate. DL-panthenol and derivatives may also be employed. Total amount of vitamins when present in compositions according to the present invention may range from 0.001 to 10%, preferably from 0.01% to 1%, optimally from 0.1 to 0.5% by weight.

- 5     [00029]     Another type of useful substance can be that of an enzyme such as oxidases, proteases, lipases and combinations. Particularly preferred is superoxide dismutase, commercially available as Biocell SOD from the Brooks Company, USA.
- 10     [00030]     Anti-microbial agents may also be useful. These can include triclosan, chlorhexidene, parabens, zinc salts and combinations thereof in amounts from 0.00001 to 5% by weight.
- 15     [00031]     Skin lightening compounds may be included in the compositions of the invention. Illustrative substances are placental extract, lactic acid, niacinamide, arbutin, kojic acid, ferulic acid, resorcinol and derivatives including 4-substituted resorcinols and combinations thereof. Amounts of these agents may range from about 0.1 to about 10%, preferably from about 0.5 to about 2% by weight of the compositions.
- 20     [00032]     A variety of herbal extracts may optionally be included in compositions of this invention. Illustrative are green tea, chamomile, licorice and extract combinations thereof. The extracts may either be water soluble or water-insoluble carried in a solvent which respectively is hydrophilic or hydrophobic. Water and ethanol are the preferred extract solvents.

5 [00033] Also included may be such materials as lipoic acid, retinoxytrimethylsilane (available from Clariant Corp. under the Silcare 1M-75 trademark), ceramides (including Ceramide 1, Ceramide 3, Ceramide 3B and Ceramide 6), dehydroepiandrosterone (DHEA) and combinations thereof. Amounts of these materials may range from about 0.000001 to about 10%, preferably from about 0.0001 to about 1% by weight.

10 [00034] Colorants, fragrances, opacifiers and abrasives may also be included in compositions of the present invention. Each of these substances may range from about 0.05 to about 5%, preferably between 0.1 and 3% by weight.

15 [00035] The term "comprising" is meant not to be limiting to any subsequently stated elements but rather to encompass non-specified elements of major or minor functional importance. In other words the listed steps, elements or options need not be exhaustive. Whenever the words "including" or "having" are used, these terms are meant to be equivalent to "comprising" as defined above.

20 [00036] Except in the operating and comparative examples, or where otherwise explicitly indicated, all numbers in this description indicating amounts of material ought to be understood as modified by the word "about".

[00037] The following examples will more fully illustrate the embodiments of this invention. All parts, percentages and proportions referred to herein and in the appended claims are by weight unless otherwise illustrated.

## EXAMPLE 1

[00038] Subsequent to shaving, a post-application formula is placed onto areas of the face that have already been shaved. The formula is outlined in Table I below.

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TABLE I

INGREDIENT	WEIGHT %
PHASE A	
Water	Balance
Disodium EDTA	0.05
Methyl Paraben	0.15
Magnesium Aluminum Silicate	0.60
Triethanolamine	1.20
PHASE B	
Xanthan Gum	0.20
Natrosol® 250HHR (ethyl cellulose)	0.50
Butylene Glycol	3.00
Glycerin	2.00
PHASE C	
Sodium Stearoyl Lactylate	0.10
Glycerol Monostearate	1.50
Stearyl Alcohol	1.50
Isostearyl Palmitate	3.00
Silicone Fluid	1.00
Cholesterol	0.25
Sorbitan Stearate	1.00
Butylated Hydroxy Toluene	0.05
Vitamin E Acetate	0.01
PEG-100 Stearate	2.00
Stearic Acid	3.00
Propyl Paraben	0.10
Parsol MCX®	2.00
Caprylic/Capric Triglyceride	0.50

CHENEY ET AL.  
J6848(C)  
03-0169-CP/TR

Hydroxycaprylic Acid	0.01
C12-15 Alkyl Octanoate	3.00
PHASE D	
Ammonium Malonate	2.00
PHASE E	
Vitamin A Palmitate	0.10
Bisabolol	0.01
Vitamin A Acetate	0.01
Fragrance	0.03
Retinol 50C	0.02

## EXAMPLE 2

[00039] Illustrated herein is a skin cream pre-shaving formulation according to the present invention.

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TABLE II

INGREDIENT	WEIGHT %
Glycerin	6.93
Niacinamide	5.00
Sodium Malonate	5.00
Permethyl 101A <sup>1</sup>	3.00
Sepigel 305 <sup>2</sup>	2.50
Q2-1403 <sup>3</sup>	2.00
Isopropyl Isostearate	1.33
Arlatone 2121 <sup>4</sup>	1.00
Cetyl Alcohol CO-1695	0.72
SEFA Cottonate <sup>5</sup>	0.67
Tocopherol Acetate	0.50
Panthenol	0.50
Stearyl Alcohol	0.48
Titanium Dioxide	0.40
Disodium EDTA	0.10
Glydant Plus <sup>6</sup>	0.10
PEG-100 Stearate	0.10
Stearic Acid	0.10
Purified Water	Balance

<sup>1</sup> Isohexadecane, Presperse Inc., South Plainfield, NJ

<sup>2</sup> Polyacrylamide(and)C13-14 Isoparaffin(and) Laureth-7, Seppic Corporation, Fairfield, NJ

<sup>3</sup> dimethicone(and)dimethiconol, Dow Corning Corp. Midland, MI

<sup>4</sup> Sorbitan Monostearate and Sucrococoate, ICI Americas Inc., Wilmington, DE

<sup>5</sup> Sucrose ester of fatty acid

<sup>6</sup> DMDM Hydantoin (and) Iodopropynyl Butylcarbamate, Lonza Inc., Fairlawn, NJ

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### EXAMPLE 3

[00040] A powdered post-shaving composition according to the present invention is outlined in Table III below.

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TABLE III

INGREDIENT	WEIGHT %
Polysilicone-11	22.5
Cyclomethicone	54
Petrolatum	11
Lithium Malonate	7
Dimethicone Copolyol	0.5

### EXAMPLE 4

[00041] A relatively anhydrous composition according to the present invention  
10 for application prior to shaving is reported in Table IV below.

TABLE IV

INGREDIENT	WEIGHT %
Cyclomethicone	80.65
Dimethicone	9.60
Squalane	6.00
Isostearic Acid	1.90
Borage Seed Oil	0.90
Ammonium Malonate	0.50
Retinyl Palmitate	0.25
Ceramide 6	0.10
Tocopherol	0.10



## EXAMPLE 5

[00042] An aerosol packaged foaming shaving preparation applied for concurrent use with a razor is outlined in Table V.

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TABLE V

INGREDIENT	WEIGHT %
Sunflower Seed Oil	20.00
Maleated Soybean Oil	5.00
Silicone Urethane	1.00
Polyglycero-4 Oleate	1.00
Stearate	15.00
Sodium Lauryl Ether Sulphate (25% active)	15.00
Cocoamidopropylbetaine	15.00
DC 1784® (Silicone Emulsion 50%)	5.00
Polyquaternium-11	1.00
Arginine Malonate	1.00
Water	Balance

10 [00043] An aerosol is prepared using 92% by weight of the concentrate in Table VIII and 8% propellant, the latter being a combination of dimethylether, isobutane and propane.

[00044] The foregoing description and examples illustrate selected embodiments of the present invention. In light thereof variations and modifications will be suggested to one skilled in the art, all of which are within the spirit and purview of this invention.